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Factors Influencing Knowledge of Farmers on Sri Paddy Cultivation: Evidence from Kohima District of Nagaland

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ABSTRACT: System of Rice Intensification (SRI) is a farming methodology which is primarily aimed at increasing the yield of rice produced in farming. It is a methodology for comprehensively managing and conserving resources by changing the way that land, seeds, water, nutrients, and human labour are used to increase productivity. Rice is an important cereal crop in Nagaland and also the staple food of the state but the paddy cultivation techniques adopted by the majority of farmers are still traditional. So, a research study was undertaken in Kohima District to examine the factors influencing knowledge of farmers on recommended SRI paddy cultivation technology including a sample size of 120 farmers. The study revealed that majority 93.33 % of the farmers growing SRI paddy had overall medium level of knowledge on SRI paddy cultivation whereas for conventional paddy growers 66.67 per cent had low level of knowledge. Variables like formal sources of information, scientific orientation, training exposure, attitude, family size, age, mass media and market orientation were found associated in influencing the knowledge level of recommended SRI paddy cultivation. Therefore, the study recommends organizing need based training programmes, demonstration, field trips, by different training agents/agencies/extension agents for enhancing more knowledge of the farmers for improving adoption of SRI technology and productivity of paddy cultivation.

Keywords: SRI paddy, socio-economic characteristics, knowledge, regression, Nagaland.

INTRODUCTION

SRI is a promising systemic farm based technology to enhance rice production at affordable costs reducing input requirements as well as causing minimal harm to the environment. It has been found helpful to enhance yield and substantially reduce water and other input requirements by altering plant, soil, water and nutrient management practices. The method completely deviates from the traditional way of cultivating paddy. The technical components of SRI are typically summarized as a list of five or six key practices that consist of crop establishment, water management and weed control, combined with soil aeration and the use of organic fertilizer. This comprises of three major principles: soil management, plant management and water management. In India, SRI is becoming popular with farmers and taking firm root with about 1 million hectares of area under SRI cultivation making it 2.42 per cent of the country's total area under rice cultivation (Arsil *et al.,* 2022).

Nagaland basically has an agricultural economy. About 70% of the population is dependent on agriculture for their livelihood. Rice, an important cereal crop in Nagaland and is the staple food of the people. In Nagaland, SRI technology was introduced under the National Food Security Mission (NFSM) in the year 2013. Districts covered under NSFM rice include Dimapur, Phek, Kohima, Tuensang, Mokokchung, Wokha, Peren, Kiphire, Longleng, Zunheboto and mon. So far, the adoption of SRI was found to be highest in the district of Kohima. According to 2015-2016 census, agriculture provides full time employment to 9.04 per cent of total workers. In Kohima district paddy is cultivated in total area of 16000 ha with production of 43, 443 mt (both dry and wet rice included) (Nagaland Statistical Handbook, 2021). Kezoma village of Kohima district has the highest number of farmers adopting SRI and it is also the first village to adopt this method on a mass scale.

The agricultural techniques adopted by the paddy farmers are largely traditional. As a result, the productivity is low. Paddy being a staple food the productivity needs to be upgraded. Increasing rice productivity and profitability is one of the most important means to improving rural households' income and welfare (Muraoka *et al.,* 2022). State Department of agriculture has taken the initiatives to promote SRI technique of paddy cultivation since years but expected result is yet to be achieved. Thus keeping in view the above facts, a research study was undertaken with an objective to examine the factors influencing knowledge level of the respondents with respect to SRI paddy cultivation technology.

MATERIAL AND METHODS

The study was conducted in Kohima district of Nagaland purposively as the use of System of rice

intensification is observed to be higher in Kohima district than any other districts. It consists of seven Rural Development Blocks namely Kohima, Chiephobozou, Tseminyu, Jakhama, Chunlikha, Sechu-zubza and Botsa. Jakhama block has the maximum number of SRI farmers. So Jakhama block was purposively selected for the present study. From the selected block, three villages namely Kezoma, Kezo Basa and Kigwema were purposively selected since these villages have high SRI paddy cultivators. Out of these, paddy farmers both from SRI and Conventional paddy growers in the ratio of 3:1 were selected from each village. Thus 30 SRI and 10 conventional paddy farmers were selected from each village (three) so as to make a sample size of 120 Paddy Farmers. Personal interview was conducted for collection of data using pre - tested interview schedule.

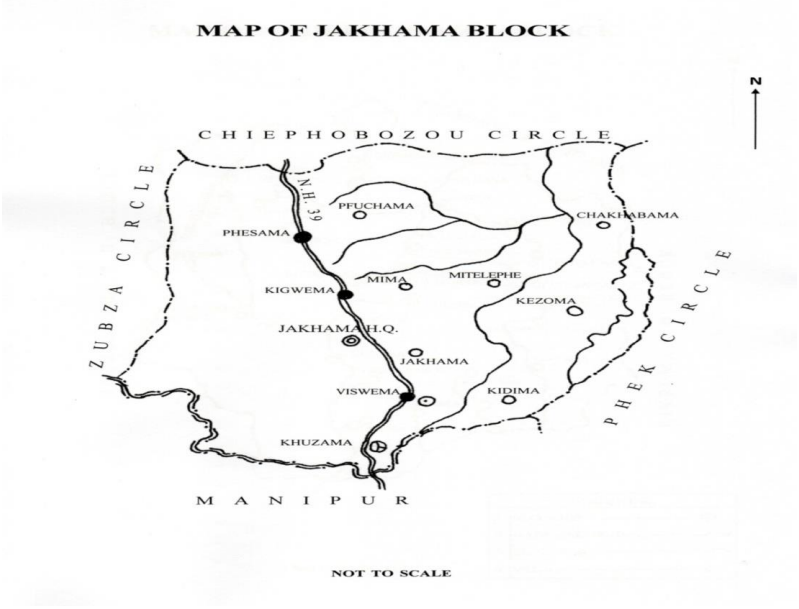

Fig. 1. Map of study area.

RESULTS AND DISCUSSION

A. Socio-economic, psychological and personal characteristics of the respondents

The findings in Table 1 revealed that majority (62. 22%) of the respondents who were involved in SRI and Conventional paddy cultivation was in the age group of 35-55 years. This finding was in line with the findings of (Sharma and Pariha 2021). 86.67 per cent of the SRI respondents were male whereas 73.33 per cent of the Conventional paddy growers were male. These findings were in accordance with the findings of Ravichandran and Prakash (2015); Phukan *et al. (*2017). 41.11 per cent of the SRI respondents had medium sized family ranging from 5-8 members whereas most (50%) of the Conventional paddy growers had small sized family members having less than 5 members. Majority (86.67%) of the SRI respondents had nuclear family whereas majority (93.33%) of the Conventional paddy respondents had nuclear family. This finding was in line with the findings of (Kumar *et al.,* 2021). It was found that majority (36.67%) of the SRI respondents were illiterate, whereas majority (40.00%) of the Conventional paddy growers were illiterate. The finding was in line with the findings of (Shakrawar and Naberia 2018). 48.89 per cent of the respondents had small size of total land holding (2.47-4.94 acre) with mean land holding of 3.5 acre whereas majority (40.00%) of the Conventional paddy growers had medium size of total land holding (9.95-9.88 acre) with mean land holding of 6 per cent. This finding was in accordance with the findings of (Pandey, 2016). For SRI paddy cultivation the mean total land holding size (3.53 acre) was highest in case of medium category of farmers. The percentage of land utilized was highest (62.80 %) in case of medium category of farmers. For Conventional paddy cultivation the mean total land holding size (9 acre) was highest in case of large category farmers and the percentage of land utilized was highest (75 %) in case of large farmers.

It was revealed that majority (70 %) of the respondents including both SRI and Conventional paddy growers had medium level utilization of overall information sources. Majority (43.33 %) of SRI respondents had medium level of social participation, whereas for Conventional paddy cultivation majority (50.00 %) had medium level of social participation. This finding was in line with the findings of Kumar *et al.* (2015); Prusty *et al.* (2020). It was also revealed that 67.78 % of SRI respondents had medium level of market orientation, whereas for Conventional paddy cultivation 76.67 % had high level of market orientation. Majority SRI (96.67%) had medium level of scientific orientation whereas for Conventional paddy growers majority (80 %) had low level of scientific orientation. 57.77% of SRI farmers had undergone training for more than two days, whereas for Conventional paddy growers majority (76.67 %) had not attended any trainings. Majority of SRI (92.22 %) had favourable attitude towards improved paddy cultivation, whereas for Conventional paddy cultivation majority (70%) had less favourable attitude towards improved paddy cultivation.

B. Knowledge level of farmers on recommended SRI paddy cultivation technology

It was revealed from Table 2 that majority (93.33 %) of the respondents had medium level of knowledge on SRI paddy cultivation whereas for Conventional paddy growers 66.67 per cent had low level of knowledge on improved paddy cultivation technology.

Table 1: Socio-economic, psychological and personal characteristics of the respondents (n=120).

Attributes	Category	SRI Paddy Farmers	Conventional Paddy Farmers
		%	%
Age	Young (<35 years)	3.33	0
	Medium (35 - 55 years)	**62.22**	43.33
	Old (<55 years)	34.45	**56.67**
Sex	Male	**86.67**	**73.33**
	Female	13.33	26.67
Family Size	Small (<5 members)	37.78	**50.00**
	Medium (5-8 members)	**41.11**	43.33
	Large (>8 members)	21.11	6.67
Family Type	Joint	13.33	6.67
	Nuclear	**86.67**	**93.33**
Education	Illiterate	**36.67**	**40.00**
	Primary	17.78	13.33
	Middle school	14.44	13.33
	High School	18.89	16.67
	Higher Secondary	6.67	10.00
	Graduate & above	5.55	6.67
Total land holding	Marginal (<2.47 acre)	13.33	26.67
	Small (2.47-4.94 acre)	**48.89**	26.67
	Medium (4.95-9.88 acre)	37.78	**40.00**
	Large (>9.89 acre)	0	2
Land under paddy cultivation	<2.47 acre	**62.50**	68.75
	2.47-4.94 acre	62.34	51.85
	4.95-9.88 acre	62.80	71.21
	>9.89 acre	0	**75**
Level of information sources utilized	Low (<5.52)	14.44	10
	Medium (5.52-12.19)	**70**	**70**
	High (<12.19)	15.56	20
Level of social participation	Low (<0.11)	33.33	36.67
	Medium (0.11-1.69)	**43.33**	**50.00**
	High (>1.69)	23.33	13.33
Level of Market Orientation	Low (<0.11)	15.56	0
	Medium (0.11-1.69)	**67.78**	23.33
	High (>1.69)	16.67	**76.67**
Level of Scientific Orientation	Low (<0.11)	0	**80**
	Medium (0.11-1.69)	**96.67**	20
	High (>1.69)	3.33	0
Training Exposure	No training	15.56	**76.67**
	1 day only	26.67	16.67
	More than 2 days	**57.77**	6.67
Level of Attitude	Low (<0.11)	0	**70**
	Medium (0.11-1.69)	**92.22**	30
	High (>1.69)	7.78	0

Table 2: Distribution of respondents based on overall Knowledge level of recommended SRI paddy cultivation.

Attributes	Category	SRI Paddy Farmers	Conventional Paddy Farmers
Knowledge level	Low (<0.11)	**0**	**66.67**
	Medium (0.11-1.69)	**93.33**	33.33
	High (>1.69)	6.67	0

C. Correlation between independent variables and knowledge level of farmers on recommended SRI paddy cultivation

The findings in Table 3 revealed that family size had positive and significant correlation coefficient with the knowledge level of recommended paddy cultivation of the respondents at 5% level of probability, which inferred that the respondents having higher family size had higher level of knowledge level. The variable 'age' had negative and significant relationship with the knowledge at 5% level of probability, which inferred that young SRI paddy farmers had higher level of knowledge on recommended cultivation practices of SRI paddy. Further the variables *viz*., mass media, market orientation had negative and significant correlation with the knowledge level of the respondents at 5% level of probability. Therefore, all of these variables were found important as influencing factors for increasing the knowledge level of recommended paddy cultivation whereas.

Further, it was found that independent variables like sex, family type, education, size of total land holding (acre), size of land holding under SRI and informal sources of information had non significant correlation with the knowledge level of recommended paddy cultivation of the respondents. Thus, these variables were not associated in influencing the knowledge level of recommended paddy cultivation.

Table 3: Correlation between independent variables and knowledge level of farmers on recommended SRI paddy cultivation.

Independent Variables	Correlation Coefficient (r)
Age	-0.249**
Sex	0.010^{NS}
Family Size	0.189*
Family Type	-0.161^{NS}
Education	0.127^{NS}
Size of total land holding(acre)	-0.056^{NS}
Size of land holding under SRI	-0.118^{NS}
Mass media	-0.200*
Formal sources	0.317**
Informal sources	-0.017^{NS}
Social participation	0.144^{NS}
Market orientation	-0.233*
Scientific orientation	0.780**
Training exposure	0.602**
Attitude	0.740**

D. Regression of predictor variables with Knowledge of SRI Technology

The regression of predictor variables with Knowledge of SRI technology have been depicted in Table 4. The regression model included 7 variables. It was found that variable Age had negative regression coefficient (-0.008) and significant at 5 % level of probability. Education had positive regression coefficient (0.175) and significant at 5 % level of probability, Total land holding size had negative regression coefficient (-0.005) and significant at 5% level of probability. Social participation and Extension contact had positive regression coefficient of 0.407 and 0.201 respectively and significant at 5% level of probability. Scientific orientation had positive regression coefficient (0.296) and significant at 1% level of probability and Attitude had positive regression coefficient (0.180) and significant at 5% level of probability. These variables combined explained about 99.1% of the total variations for Knowledge of SRI technology of paddy farmers. F value (36.28) was significant at 1% level of probability.

Table 4: Regression of predictor variables with Knowledge of SRI Technology.

Model	Regression Coefficients	Standard Error	t values	Sig.
Constant	-.703	1.852	-.380	.705
Age	-.008	.011	-.755	.452
Education	.175	.098	1.785	.077
Total land holding size	-.005	.041	-.114	.909
Social participation	.407	.190	2.137*	.035
Extesion contact	.201	.067	2.983*	.004
Scientific orientation	.296	.074	3.997**	.000
Attitude	.180	.057	3.155**	.002

R =0.833; R^2 = 0.694 ; R^2 adjusted = 0.675; F= 36.28^{**}; * Significant at 5 % ; ** Significant at 1 %

CONCLUSIONS

Majority 93.33 % of the respondents had overall medium level of knowledge on improved paddy cultivation whereas for Conventional paddy growers 66.67 per cent of them had low level of knowledge on improved paddy cultivation. Variables like formal sources of information, scientific orientation, training exposure, attitude, family size, age, mass media and

market orientation were associated in influencing the knowledge level of recommended paddy cultivation. The predictor variables Age, Education, Total land holding size, Social participation, Extension Contact, Scientific Orientation and Attitude combined explained about 99.1 % of the total variations for Knowledge of SRI technology of paddy farmers. It is therefore recommended to organize need based training programmes, demonstration, field trips, study tour in the prioritized areas which should be imparted by different training agencies/ extension agents. This may be helpful to enhance the knowledge of farmers for improving paddy cultivation and increasing their profitability. The state government should provide adequate quality inputs and timely assistance to farmers for SRI paddy cultivation so that the farmers could take up SRI paddy cultivation in larger areas for higher production and income.

FUTURE SCOPE

Further studies may be conducted in other SRI paddy growing areas/districts so that the findings of the study can be compared.

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Conflict of Interest. None.

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